Role of Mobility in Livable Communities
Mobility + Livable Communities

- 3 Key Concepts
- Example: Senior Mobility
3 Key Concepts
“Location Efficiency”
Spatial Relationships

Community

Region

Neighborhood

Home
“Location Efficiency” =

Complete Neighborhoods + Regional Access
the neighborhood

- ¼ mile radius
- 160 – 200 acres

Graphic: Doug Farr, Sustainable Urbanism
the complete neighborhood

• schools
• local retail
• services
• parks
• diverse housing
• transit

Graphic: Doug Farr, Sustainable Urbanism
the complete neighborhood

- walkable
- mixed-use
- transit-served

Graphic: Doug Farr, Sustainable Urbanism
“Location Efficiency” = Complete Neighborhoods + Regional Access
Regional Accessibility
Place Types
* from EPA/Caltrans work

Regional Accessibility

Neighborhood Completeness

Place Types

HIGH

LOW

Regional Accessibility

HIGH

LOW
Regional Accessibility

Neighborhood Completeness

Complete, Accessible
- Urban centers
- Core neighborhoods
- Walkable places
- Good public health
- Great transit
- Good access to jobs
- Low oil dependency
- High housing costs

Regional Accessibility

High

Low

Neighborhood Completeness

High

Low
Complete, Low Accessibility

- Stand-alone cities
- Intact rural towns
- Walkable places
- Good public health
- Limited local transit
- Limited access to jobs
- Lower housing costs
Incomplete, Accessible

- First tier suburbs
- Connected sprawl
- Few walkable places
- Poor public health
- Fair to good transit
- Good access to jobs
- Higher housing costs
Incomplete, Low Accessibility

- Fringe & exurban sprawl
- High oil dependency
- Tight household budgets
- Mortgage foreclosures
- Few walkable places
- Poor public health
- Poor access to jobs
- Little or no transit
Location Efficiency Outcomes

- VMT per capita
- Access to daily household needs
- Walkability, active living
- Household transportation costs
- Business transportation costs
- Economic viability
- Access to jobs & opportunities
“Location Efficiency” =
Complete Neighborhoods + Regional Access
“Livability” = Affordable + Healthy + Opportunities + Identity
household economics

Sales

available for:
- food
- health care
- education
- consumer expenditures
- recreation
- savings

needed for:
- housing
- transportation
share of family income spent on housing & transportation

family income = $35,000 - $50,000

central city: 23% housing, 16% transportation, 39% total
near jobs: 26% housing, 23% transportation, 49% total
away from jobs: 25% housing, 26% transportation, 51% total

Source: A Heavy Load, Center for Neighborhood Technology
share of family income spent on housing & transportation

family income = $20,000 - $35,000

<table>
<thead>
<tr>
<th>Location</th>
<th>Housing</th>
<th>Transportation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>central city</td>
<td>32 %</td>
<td>22 %</td>
<td>54 %</td>
</tr>
<tr>
<td>near jobs</td>
<td>35 %</td>
<td>31 %</td>
<td>66 %</td>
</tr>
<tr>
<td>away from jobs</td>
<td>33 %</td>
<td>37 %</td>
<td>70 %</td>
</tr>
</tbody>
</table>

Source: A Heavy Load, Center for Neighborhood Technology
household economics

available for:
- food
- health care
- education
- consumer expenditures
- recreation
- savings

needed for:
- housing
- transportation

CU class estimate
household economics

available for:
- food
- health care
- education
- consumer expenditures
- recreation
- savings

needed for:
- housing
- transportation

actual for many working families
**Impact on Local Economies**

*How much household income is left for:*

<table>
<thead>
<tr>
<th>Category</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOOD</td>
<td>...cheaper, less nutritious foods</td>
</tr>
<tr>
<td>HEALTH CARE</td>
<td>...less insurance, less preventive care</td>
</tr>
<tr>
<td>EDUCATION</td>
<td>...less higher education</td>
</tr>
<tr>
<td>SHOPPING</td>
<td>...lower sales tax receipts</td>
</tr>
<tr>
<td>RECREATION</td>
<td>...less sports activity, less exercise</td>
</tr>
<tr>
<td>SAVINGS</td>
<td>...lower savings rate, higher cost of capital</td>
</tr>
</tbody>
</table>
“Livability” = Affordable + Healthy + Opportunities + Identity
US Health Care
% of GDP

Year | % of GDP
--- | ---
1960 | 5.1
1970 | 7.0
1980 | 8.8
1990 | 12.1
2001 | 14.1
2007 | 16.3
2017 | 19.5
2020 | > 20
2008 | 9.5

transportation
Annual Health Care Costs/Per Capita

- Germany: $2,983
- Australia: $2,886
- Denmark: $2,743
- France: $3,048
- Ireland: $2,455
- Japan: $2,249
- Sweden: $2,745
- Switzerland: $3,847
- United Kingdom: $2,317
- Canada: $2,998
- United States: $5,711

Source: Kaiser Family Foundation, Visual Economics, 2010
Average Life Expectancy

- Japan: 82.1
- Germany: 79.0
- Switzerland: 81.3
- United Kingdom: 79.0
- United States: 77.0

Source: Kaiser Family Foundation, Visual Economics, 2010
Scale – United States Economy

($ Billions/Year)

Cost of obesity: $147
Cost of traffic air pollution: $80
Cost of traffic accidents: $180
Scale – United States Economy

($ Billions/Year)

$ 407

Transportation impact on public health

$ 199

Public sector transportation expenditures
Transportation & Public Health

Traffic Safety + Personal Health
Annual US Traffic Fatalities

Source: NHTSA, FHWA
US Traffic Fatality Rate/HMVM

(hundred million vehicle miles)

Source: NHTSA, FHWA
US Traffic Fatality Rate/HMVM

(hundred million vehicle miles)

Source: NHTSA, FHWA
Source: NHTSA, FHWA
“Changes in highway infrastructure between 1984 and 1997 have not reduced traffic fatalities and injuries, and have even had the effect of increasing total fatalities and injuries.

Other factors, primarily changes in the demographic age mix of the population, increased seat belt usage, and improvements in medical technology are responsible for the downward trend in fatal accidents.”

Noland, R. B. 2001, Transportation Research Board
2008 Fatalities

- Vehicle Occupants: 64%
- Motorcyclists: 18%
- Pedestrians: 15%
- Bicyclists: 2%
- Other: 1%
US Injury Rate: Pedestrians Hit by Motor Vehicles
(rate/100,000 population)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Rate/100,000 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5</td>
<td>10</td>
</tr>
<tr>
<td>5 - 9</td>
<td>19</td>
</tr>
<tr>
<td>10 - 15</td>
<td>34</td>
</tr>
<tr>
<td>16 - 20</td>
<td>42</td>
</tr>
<tr>
<td>21 - 24</td>
<td>39</td>
</tr>
<tr>
<td>25 - 34</td>
<td>24</td>
</tr>
<tr>
<td>35 - 44</td>
<td>19</td>
</tr>
<tr>
<td>45 - 54</td>
<td>17</td>
</tr>
<tr>
<td>55 - 64</td>
<td>20</td>
</tr>
<tr>
<td>65 - 74</td>
<td>20</td>
</tr>
<tr>
<td>75 - 85</td>
<td>10</td>
</tr>
<tr>
<td>85 +</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: NHTSA, 2008
US Fatality Rate: Pedestrians Hit by Motor Vehicles

(rate/100,000 population)

Source: NHTSA, 2008
Traffic accidents are the leading cause of unintentional injury death in children age 1 - 4

- Motor vehicle accidents: 31%
- Drowning: 27%
- Fires & burns: 14%
- Falls: 2%
- Suffocation: 8%
- Poisoning: 2%
- Other injuries: 15%

Source: CDC National Vital Statistics System, 2000 - 2005
Traffic accidents are the leading cause of unintentional injury death in children age 5 – 9

- Motor vehicle accidents: 53%
- Drowning: 13%
- Fires & burns: 13%
- Falls: 1%
- Suffocation: 4%
- Poisoning: 1%
- Other injuries: 15%

Source: CDC National Vital Statistics System, 2000 - 2005
Traffic accidents are the leading cause of unintentional injury death in children age 10 – 14

- Motor vehicle accidents: 58%
- Drowning: 18%
- Fires & burns: 6%
- Falls: 2%
- Suffocation: 4%
- Poisoning: 2%
- Other injuries: 18%

Source: CDC National Vital Statistics System, 2000 - 2005
Traffic accidents are the leading cause of unintentional injury death in children age 15 – 19

- Motor vehicle accidents: 76%
- Drowning: 5%
- Fires & burns: 1%
- Falls: 1%
- Suffocation: 4%
- Poisoning: 7%
- Other injuries: 9%

Source: CDC National Vital Statistics System, 2000 - 2005
Humans:

- recently descended from nomadic hunter/gatherers...
- walked & worked, burning calories
- experienced the world @ 2 – 3mph
- bodies were designed for collisions @ < 5 mph
we evolved as “walkers”
we are still “walkers”
human history

- 00:06: Villagers
- 23:54: Nomadic hunter-gatherer
this is what we do...
...but it is not who we are.
we cannot escape our DNA...
...no matter how hard we try
How Children Get to School
*(ages 5 – 14)*

- **walked or biked**
  - 1969: 48%
  - 2009: 13%

- **private auto**
  - 1969: 12%
  - 2009: 44%

Source: 2009 National Household Transportation Survey
Research

- US Centers for Disease Control
- Robert Wood Johnson Foundation
Residents of walkable neighborhoods were more likely to meet physical activity guidelines

Driving is a risk factor for obesity

Lopez-Zetina, Health and Place, 2006
# Extensive Research

## States with the Highest Rates of Physical Inactivity

<table>
<thead>
<tr>
<th>Rank</th>
<th>State</th>
<th>Percentage of Adult Physical Inactivity (Based on 2006-2008 Combined Data, Including Confidence Intervals)</th>
<th>Obesity Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mississippi</td>
<td>31.8% (+/-0.9)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Kentucky</td>
<td>30.4% (+/-1.0)</td>
<td>7</td>
</tr>
<tr>
<td>3 (tie)</td>
<td>Louisiana</td>
<td>30.3% (+/-0.9)</td>
<td>8</td>
</tr>
<tr>
<td>3 (tie)</td>
<td>Oklahoma</td>
<td>30.3% (+/-0.8)</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>Tennessee</td>
<td>29.8% (+/-1.2)</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Alabama</td>
<td>29.5% (+/-1.0)</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Arkansas</td>
<td>28.8% (+/-0.9)</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>Texas</td>
<td>28.4% (+/-0.9)</td>
<td>14</td>
</tr>
<tr>
<td>9</td>
<td>West Virginia</td>
<td>28.3% (+/-1.0)</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>New Jersey</td>
<td>26.7% (+/-0.8)</td>
<td>42</td>
</tr>
</tbody>
</table>

*Note: For rankings, 1 = Worst Health Outcome. 1 = Highest Rates of Physical Inactivity.*
Research Conclusion #1:

People who are active as part of a regular daily routine are less obese and are healthier.

“Active Living...”
Research Conclusion #2:

People who live where walking and bicycling are convenient, safe and comfortable are much more active.

“...by Design”
“Active Living by Design”
“Livability” = Affordable + Healthy + Opportunities + Identity
US Population

- 2005: 295 M
- 2030: 364 M (+23%)
- 2050: 392 M (+33%)

Source: US Census Bureau, 12/08
US Households

1960:
- With children: 48%
- Without children: 52%

2000:
- With children: 33%
- Without children: 67%

2040:
- With children: 26%
- Without children: 74%

Source: Dr. Arthur Nelson, University of Utah
US Households - % of Growth

2000 - 2040

14%

86%

Source: Dr. Arthur Nelson, University of Utah
US Dwelling Units

Millions

<table>
<thead>
<tr>
<th></th>
<th>2003 Supply</th>
<th>2025 Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attached</td>
<td>27</td>
<td>44</td>
</tr>
<tr>
<td>Small Lot</td>
<td>22</td>
<td>40</td>
</tr>
<tr>
<td>Large Lot</td>
<td>57</td>
<td>56</td>
</tr>
</tbody>
</table>

Source: Dr. Arthur Nelson, University of Utah, JAPA 72.4
US Dwelling Units

Millions

\[\begin{align*}
\text{Attached} & : +17 \\
\text{Small Lot} & : +18 \\
\text{Large Lot} & : -1
\end{align*}\]

Demand to 2025

Source: Dr. Arthur Nelson, University of Utah, JAPA 72.4
US Households

2007 Supply: 116
43

2030 Market: 140
70 (-3)

Net Demand: 100
+27

33%

Source: National Association of Realtors & SGA
this is beginning to affect developers and housing starts
Growth goes urban

Denver trails only Douglas County in metro-area population gains

By Burt Hubbard The Denver Post

Denver’s growth

Denver’s population last year grew faster than all but one of its neighboring suburban counties, the first time that has happened this decade.

Denver wasn’t the only growth superstar in Colorado, according to the report. The Greeley metro area, consisting of Weld County, was the fourth fastest growing metro area in the nation since 2000.

And five Western Slope counties, led by energy-rich Garfield County, ranked in the top 10 in population gains in Colorado in the 12 months ending in July 2008.

The report showed Denver’s population grew 2.7 percent in the 12 months ending July 2008, adding about 16,000 people since July 2007 and falling just short of 600,000.

Only Douglas County, at 3.5 percent, grew faster in the seven county metro area. It’s the first time this decade that Denver has grown faster than most of its suburbs.

Jeff Romine, chief economist for the Denver Office of Economic Development, said a resurgence in housing

Source: U.S. Census Bureau
Share of New Housing Starts by Regional Location – Denver Region

<table>
<thead>
<tr>
<th>Year</th>
<th>Suburbs and Rural</th>
<th>Central City (Denver)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-95</td>
<td>5%</td>
<td>95%</td>
</tr>
<tr>
<td>2003-08</td>
<td>21%</td>
<td>79%</td>
</tr>
<tr>
<td>2008</td>
<td>32%</td>
<td>68%</td>
</tr>
</tbody>
</table>
US Retirement Preferences

Urban: 51%
Suburban: 19%
Rural: 30%

Source: National Association of Realtors and Smart Growth America American Preference Survey 2004
Walking the Walk

How Walkability Raises Home Values in U.S. Cities

Joe Cortright, Impresa, Inc., for CEOs for Cities
August 2009
# Walkability and House Value*

<table>
<thead>
<tr>
<th>City</th>
<th>Walkability Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austin, TX</td>
<td>+ $24,871</td>
</tr>
<tr>
<td>Dallas, TX</td>
<td>+ $4,278</td>
</tr>
<tr>
<td>Fresno, CA</td>
<td>+ $7,427</td>
</tr>
<tr>
<td>Phoenix, AZ</td>
<td>+ $18,689</td>
</tr>
<tr>
<td>Sacramento, CA</td>
<td>+ $34,345</td>
</tr>
<tr>
<td>San Francisco, CA</td>
<td>+ $32,837</td>
</tr>
<tr>
<td>Seattle, WA</td>
<td>+ $19,789</td>
</tr>
<tr>
<td>Tucson, AZ</td>
<td>+ $10,841</td>
</tr>
</tbody>
</table>

* difference in house value: citywide median WalkScore compared to 75 percentile and above
the complete neighborhood

- ¼ mile radius
- 160 – 200 acres
- schools
- local retail
- services
- parks
- diverse housing
the complete neighborhood

- walkable
- mixed-use
- transit-served
- urbanism
the complete neighborhood

- stable
- increasing value
- less VMT/capita
- in demand
  - boomers
  - millennials
Walkable, mixed-use urbanism will be the primary market for new housing

Walkable, mixed-use urbanism – housing stock available in 2010

Walkable, mixed-use urbanism – housing demand to 2040

5%

Chris Leinberger, Brookings Institution
76 million elders  78 million millennials

two largest generations, same housing market: mixed-use, transit-served, walkable neighborhoods
“Livability” =
Affordable + Healthy + Opportunities + Identity
“Mobility”
“Mobility” = Travel + Circulation + Access
Elements

TRAVEL  Moving over distances

CIRCULATION  Moving within areas

ACCESS  Getting in the door
Facilities

**TRAVEL**
Freeways, arterials, rail transit, express bus lanes

**CIRCULATION**
Collectors, connectors, transit routes, bike trails and lanes

**ACCESS**
Local streets, parking, sidewalks and crosswalks
Built for...

Seattle

...travel

Redmond
Built for...

Boulder

...travel

Denver
Built for...

...circulation

Redmond

Flagstaff
Built for... Boulder...circulation...
United States

Population & VMT

- 1955: Pop. 166 millions, VMT 0.6 trillions
- 1980: Pop. 227 millions, VMT 1.5 trillions
- 2005: Pop. 300 millions, VMT 3.0 trillions

Population increased by 178% from 1955 to 2005.
VMT increased by 500% from 1955 to 2005.
United States
Annual Rate of Change in VMT

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1975-1985</td>
<td>3.35%</td>
<td>3.59%</td>
<td>2.39%</td>
<td>0.06%</td>
<td>0.03%</td>
<td>2.80%</td>
<td>0%</td>
</tr>
<tr>
<td>1985-1995</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1995-2005</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005-2006</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006-2007</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007-2008</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008-2009</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Daily Per Capita Travel

- Family/Personal: 43%
- Social/Recreational: 27%
- Church/School: 10%
- Other: 4%
- Commuting: 16%

Source: 2001 NHTS
Daily Miles of Travel Per Capita

Commute Trips

<table>
<thead>
<tr>
<th>Year</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1977</td>
<td>5.2</td>
</tr>
<tr>
<td>1983</td>
<td>5.0</td>
</tr>
<tr>
<td>1990</td>
<td>6.5</td>
</tr>
<tr>
<td>1995</td>
<td>8.7</td>
</tr>
<tr>
<td>2001</td>
<td>7.7</td>
</tr>
</tbody>
</table>

Discretionary Trips

<table>
<thead>
<tr>
<th>Year</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1977</td>
<td>20.8</td>
</tr>
<tr>
<td>1983</td>
<td>20.1</td>
</tr>
<tr>
<td>1990</td>
<td>28.4</td>
</tr>
<tr>
<td>1995</td>
<td>30.0</td>
</tr>
<tr>
<td>2001</td>
<td>32.6</td>
</tr>
</tbody>
</table>

(NHTS)
Average Trip Lengths

- Walk: 0.73
- Bicycle: 2.13
- Streetcar: 5.41
- Local Bus: 6.44
- Auto: 10.29

(2009 NHTS)
Trip Length – All Trips

- 1 mile: 28%
- 2 miles: 40%
- 3 miles: 50%
Trip Length – Driving Trips

- 1 mile: 20%
- 2 miles: 33%
- 3 miles: 43%

(2009 NHTS)
“Mobility” =

Travel + Circulation + Access
3 Key Concepts
Emerging Federal Policy
Single Purpose Spending

- Transportation
- Housing
- Public Health
- Environment
- Energy
Integrated, Strategic Investment

Public Health

Housing

Transportation

Energy

Environment

$$$

$ $$
Interagency Partnership for Livable Communities
Learning from Senior Mobility
Retirement Preferences

- Urban: 51%
- Suburban: 19%
- Rural: 30%

Source: National Association of Realtors and Smart Growth America American Preference Survey 2004
4 essentials: elder mobility
AARP: a livable community has...

- affordable & appropriate housing
- supportive community features & services
- adequate mobility options

...which together facilitate personal independence and the engagement of residents in civic and social life.
AARP livable communities model

- Adequate mobility options
- Suitable home
- Supportive community features & services

Diagram showing connections between livable community features and services.
4 essentials: elder mobility

- land use mix
- pedestrian supportive environment
- connected street network
- high frequency transit service
4 essentials: elder mobility

- land use mix
- pedestrian supportive environment
- connected street network
- high frequency transit service
land use mix

4 essentials: elder mobility
supportive community features & services

1. active living
2. third places
3. convenience retail
4. provisions & services
5. family
6. shopping
7. medical
8. cultural
1. active living

- pedestrian-oriented environments
- trails, parks and open space
- gyms and exercise facilities
2. third places

- coffee shops, cafes
- bookstores, libraries
- churches
- bars
- plazas, parks
- senior centers
3. convenience retail

- corner market
- convenience store
4. provisions & services

- grocery
- bank
- cleaners
5. family

- grandchildren
- other family
6. shopping

- hardware
- clothing
- book store
- optical
- electronics
7. medical

- clinics, doctors
- hospitals
- pharmacy
- physical therapy
- opticians
- other specialists
8. cultural

- theater
- movie Theater
- museums
- symphony
- art gallery
- restaurants
<table>
<thead>
<tr>
<th>destinations</th>
<th>daily</th>
<th>weekly</th>
<th>monthly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. active living</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. third places</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. convenience</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. provisions</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>5. family</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6. shopping</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>7. medical</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>8. cultural</td>
<td></td>
<td></td>
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# destinations

<table>
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<tr>
<th></th>
<th>daily</th>
<th>weekly</th>
<th>monthly</th>
</tr>
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<tbody>
<tr>
<td>1. active living</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2. third places</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. convenience</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. provisions</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>5. family</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6. shopping</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>7. medical</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>8. cultural</td>
<td></td>
<td></td>
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</tbody>
</table>

*should be within walking distance*
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<tr>
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accessible by walking and fixed route transit
neighborhood completeness
4 essentials: elder mobility

- land use mix
- pedestrian supportive environment
- connected street network
- high frequency transit service
note: ADA & universal design
elderly walking environment factors

- safety & security
- street crossings
- universal access
- street design – scale, speed
- pedestrian realm – scale, layout
- urban design – street walls, building scale
- land use mix
- trees, canopies, awnings
pedestrian survival rates & vehicle speed

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>% Survive</th>
<th>% Die</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>95%</td>
<td>5%</td>
</tr>
<tr>
<td>30</td>
<td>55%</td>
<td>45%</td>
</tr>
<tr>
<td>40</td>
<td>15%</td>
<td>85%</td>
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</tbody>
</table>
**ROADWAY CORRIDOR**

- back-of-curb

**PEDESTRIAN REALM**

- clear zone
  - 8 ft. min.

**ADJACENT LAND USE**

- edge of right-of-way

- face of building

- on-street parking

- planter/furniture zone
  - 4 ft. min.

- pedestrian clear zone
  - 8 ft. min.

- frontage zone
  - 2 ft. min.

14 ft. min. total recommended
4 essentials: elder mobility

- land use mix
- pedestrian supportive environment
- connected street network
- high frequency transit service
Windsor, CO – after 1990
walk propensity

utilitarian trips
walk distances @ 250 fpm

- 5,000' in 20 min
- 3,750' in 15 min
- 2,500' in 10 min
- 1,250' in 5 min

- ⅛ mile in 5 min
- ⅛ mile in 10 min
- ⅛ mile in 15 min
- ⅛ mile in 20 min
walk distances @ 100 fpm

- 5 min: 500 feet
- 10 min: 1,000 feet
- 15 min: 1,500 feet
- 20 min: 2,000 feet

- ¼ mile
- ½ mile
- 1 mile
path index

shortest feasible route on streets & trails

straight line distance (as the crow flies)
5 – 7 minute walk

- Home
- Active living
- Third places
- Convenience retail
5 – 7 minute walk

path index:
1.4

- home
- 1. active living
- 2. third places
- 3. convenience retail
5 – 7 minute walk

path index: 4.5

home

1. active living
2. third places
3. convenience retail
good connectivity expands the range of walking trips, increasing pedestrian activity
The optimum block size for efficient traffic flow is between 330' and 528'.
common connectivity standards

- intersections/square mile (min 200)
- maximum block perimeter (1400’ – 1800’)
- block length (330’ – 528’)
- links/nodes
4 essentials: elder mobility

- land use mix
- pedestrian supportive environment
- connected street network
- high frequency transit service
high frequency transit networks

- peak service < 15 minute headways
- network of routes
- accessible vehicles
- easy access to stops and stations
boulder community transit network
community transit network
Portland, Oregon
example: Santa Fe “Elder Grace”
mobility criteria: ElderGrace

- mixed use development pattern – limited
- pedestrian supportive environment - no
- connected networks – no
- high frequency transit network - no
senior mobility

“universal mobility”
Not Included in Elder Mobility

- Access to schools (K – 12)
- Access to jobs

**Place Types**

* from EPA/Caltrans work
Wrap Up
“Location Efficiency” =
Complete Neighborhoods + Regional Access
“Livability” = Affordable + Healthy + Opportunities + Identity
"Mobility" = 
Travel + Circulation + Access
Integrated, Strategic Investment

Public Health

Housing

Transportation

Energy

Environment
Thanking You

www.charlier.org